

opposite the core indicated by the dotted circle 15^b of Fig. 6 to the thickened rim portion 15^a.

In producing this diaphragm a flat disk is utilized of uniform thickness from the center to the periphery, and then one or both faces are ground or cut down, producing a diaphragm of gradually decreasing thickness from the central part outward. This diaphragm may be cut or ground down on one side only as shown in Fig. 1 and Fig. 5, in which event one side, generally the under side will be flat, or the cutting or grinding may be done on both surfaces as shown in Fig. 6 where the diaphragm is designated 15^c. In either event the tapered surface or surfaces may be extended to the center of the diaphragm, but the central part of the diaphragm opposite the core may be and preferably is of uniform thickness.

In thus forming the diaphragm, two very important advantages are obtained. In the first place, the flux carrying capacity of the diaphragm is the same on any circular section between the central part opposite the core and the periphery where it is clamped in place as already explained, and furthermore, a uniform flexing is obtained when the diaphragm is vibrated, the flexing being substantially uniformly distributed from the periphery where it is clamped in place to the region of the center. In other words, the flexibility is that of a relatively thin diaphragm of uniform thickness, but at the same time there is sufficient metal opposite the core to carry a relatively large amount of flux, and therefore sufficient metal to enable vibration of large amplitude for a given change in the value of the current passing through the receiver coil.

Though the diaphragm may be in the form of a permanent magnet and may therefore be formed of good magnet steel as is utilized in forming the core and housing, I prefer that it be formed of soft iron which has greater permeability than magnet steel, and therefore for a given cross-section has greater flux carrying capacity.

Thus it will be seen that the improvements of this construction over that shown in my prior application are mainly of two-fold nature consisting first of a coil housing preferably in the form of a permanent magnet and formed so as to have uniform flux carrying capacity in the cylindrical part and in the base, with the flux carrying capacity of the core and cup or housing substantially the same, and secondly, in the provision of a vibratory diaphragm which may be formed of magnet steel or soft iron, preferably the latter, which is of gradually decreasing thickness from the central portion opposite the core to the pe-

ripheral clamping portion, and has substantially equal flux carrying capacity from the region of the center outwardly to the portion which is clamped between the housing and cap. By these improvements above mentioned, the sensitiveness of the receiver to very feeble currents in the receiver coil is increased.

The above novel features are capable of conjoint use and to an extent may be used advantageously independently of each other. For example, it may be desirable to form the core 12 of soft iron instead of magnet steel. Likewise my improved diaphragm 15 may be used advantageously with other forms of receivers, and is not necessarily confined to one of the general type herein illustrated. Other changes may be made, and I aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention as defined in the appended claims.

Having described my invention, I claim:

1. A telephone receiver comprising a coil, a cup-shaped housing enclosing the coil and adapted to convey flux through the base and upright portion thereof, the flux carrying capacity of the base being substantially the same from the region of the center to the periphery.
2. A telephone receiver comprising a coil, a housing receiving the coil and having base and upright portions, a diaphragm at the open end of the housing, the flux carrying capacity of the housing through different portions of the base and through the upright portions being substantially the same.
3. A telephone receiver comprising a coil, a metal housing containing the coil and a vibratory diaphragm opposite the coil, said housing having a base portion which decreases in thickness from the central part toward the periphery.
4. A telephone receiver comprising a coil having a core, a cup-shaped metal housing receiving the coil and a vibratory diaphragm opposite the coil and core, the base of the housing being thickest adjacent the center and decreasing in thickness toward the periphery, and the upright wall of the housing having substantially the thickness of the peripheral portion of the base.
5. A telephone receiver comprising a coil having a core, a metal housing receiving the same and a vibratory diaphragm at the end of the housing opposite the coil and core, the housing having a base portion at one end of the coil and a portion extending up about the side of the coil, the area of annular sections of the base portion at different distances from the center being substantially the same.
6. In a telephone receiver, a metal coil housing having a central core extending